Java Overview

Session 601

These are confidential sessions—please refrain from filming or taking pictures.

Enterprise IT

Java Overview

Scott Adler

These are confidential sessions—please refrain from filming or taking pictures.

Track-specific image to come

Our Secret Plan!

Or what you'll learn today

http://developer.apple.com/wwdc2005/

Who's Out There?

New to Java on Mac OS X
(n00b)

Seasoned Mac OS X
Java Developers

What You'll Learn Today

New to Mac OS X and Java

- Where do you start?
- What is available on Mac OS X?
- When can you try it out?

What You'll Learn Today (Cont.)

New to Mac OS X and Java

- Great platform to learn Java
- Bring your Java apps to Mac OS X
  - Learn cross platform issues
  - A good way to step in Mac OS X Java
  - Manage up better
  - Plan resources
  - Help lead your company with cross platform

What You'll Learn Today

Seasoned Mac OS X Java Developers

- What's new?
- How to get the most out of Mac OS X and Java
- Cool things you don't even know about
  - Try a new technology
  - Make your app more Mac savvy

What You'll Learn Today

Everyone

- Technologies to make your application better
- How to get questions answered by the Java Engineering team
- How to make the best out of your hands-on experience

First, let’s slay old dragons

Slaying Old Dragons!

- Is it compatible?
- Is it fast enough?
- Where is the latest JDK?
- Is Apple actively supporting Java?

Compatibility

Will my cross platform application work?

http://developer.apple.com/wwdc2005/

Fixing Bugs for Compatibility

The Java Team Has Fixed Over 2000 Bugs Since Panther

Don’t Just Take Our Word For It

Compatibility is a priority

http://developer.apple.com/wwdc2005/

“…Many (and possibly all) of these bugs appear to be fixed in Java 1.4 on Tiger.”

segal.org
Personal bug tracking website

“One of my clients just installed Tiger, put on the 1.5 release and used one of our more graphics intensive apps. Worked great. Happiness all around.”

Scott Ellsworth
Seasoned Mac OS X Java Developer

Emphasis on Compatibility

- Beyond the Java Compatibility Kit
- Unwritten specs
- Enhanced regression testing
  - JUnit

Beyond the Desktop

J2EE Development
and Deployment

J2ME Development
and Deployment

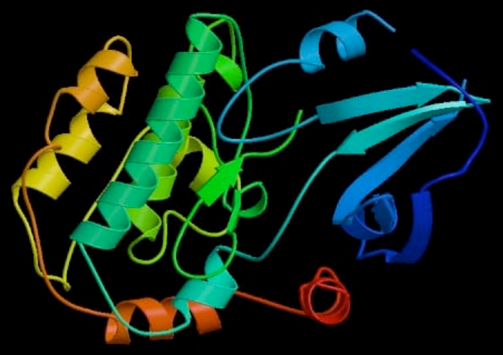
Related session **WebObjects and J2EE Deployment Workshop**	**Session 610** **Tuesday 5:00PM**
Related session **Mobile Development with Xcode for J2ME Devices**	**Session 627** **Thursday 10:30AM**

J2ME MIDP 2.0 Demo

Michael Powers
CTO, mpowerplayer inc.

http://developer.apple.com/wwdc2005/

Bundled Extensions



Java Advanced Imaging and Java 3D

WebStart

LiveConnect

Applet Support

Performance

Is it fast enough?

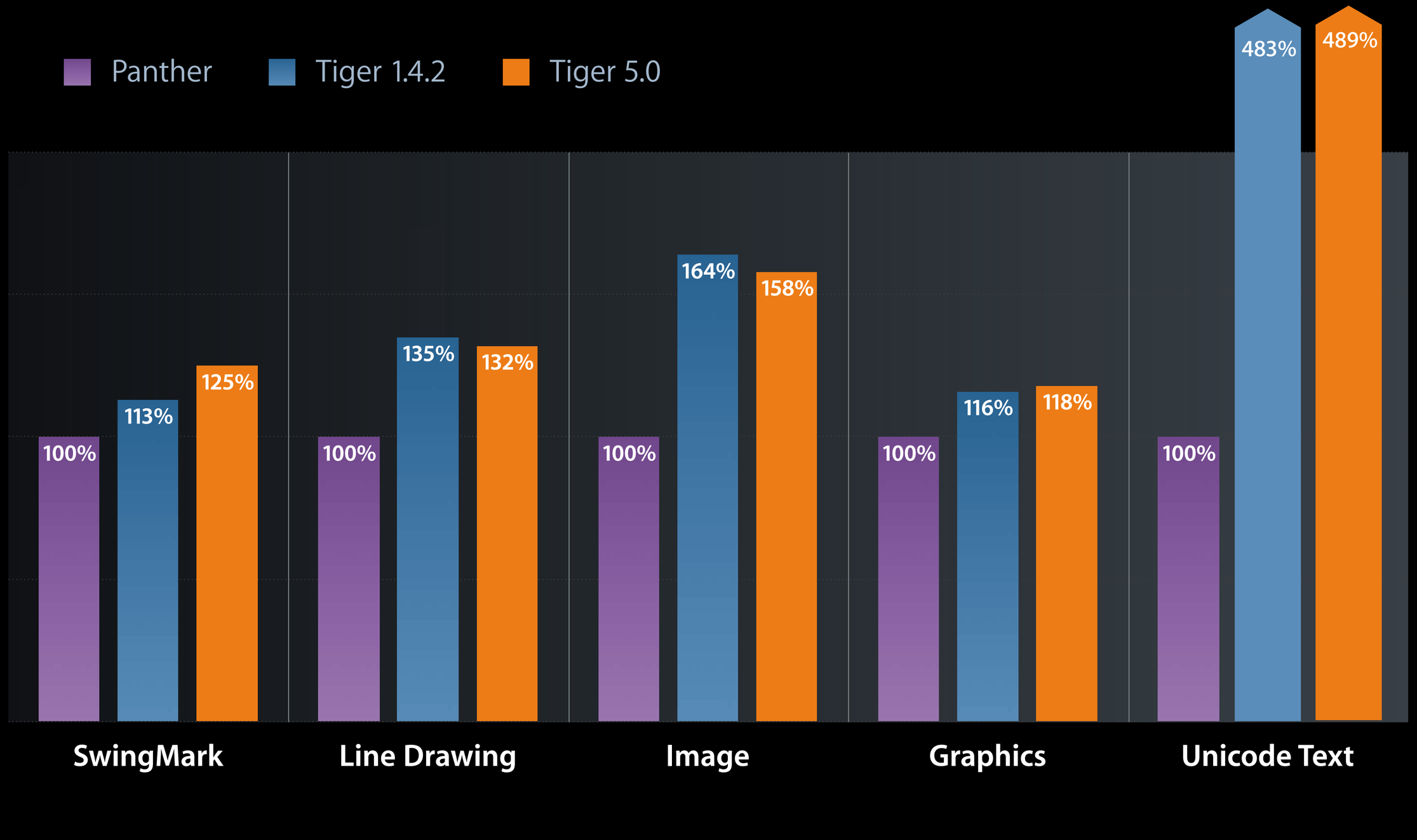
http://developer.apple.com/wwdc2005/

Fastest Java We've Ever Shipped!

"…Tiger is an improved Java environment that is expected to deliver performance improvements."

Australian Department of Defense
Sydney Morning Herald

Some Tiger Java Performance Improvements



Up to Date

Where is the latest JDK?

http://developer.apple.com/wwdc2005/

Mac OS X Tiger
Java 1.4 default

J2SE 5.0
For Mac OS X
Release 1

April 29, 2005

State of The Art

Tiger shipped a month ago with

- Java 1.3.1
- Java 1.4
  - Still the default VM on Mac OS X Tiger
    - Double clickable Java applications
    - Webstart
    - Applets
- J2SE 5.0 (1.5.0_02)
  - Download on Tiger
  - Not the default—yet

J2SE 5.0

- Both developers and users have some control
  - Applets—user controlled
  - Applications and WebStart—user influenced
  - Use Java Preferences in /Applications/Utilities/Java/J2SE 5.0
- Bundled Apps can require J2SE 5.0
- Better to test if a new feature is available
  - Check the VM version
  - Use reflection
  - Have a fallback if the feature is not present

Future

Keep an eye out for

Java 1.4.2 Tiger update

- Keep up to date with 1.4.2_xx releases
- Security Bulletins

J2SE 5.0 updates

- Available as a Software Update
- The default VM
  We need your feedback
- Keep up to date with 1.5.0_0x releases

And finally

J2SE 6.0 Mustang

~~Java 1.3~~

Move to 1.4 and Above Now.

You Have Been Warned (Again!)

Java on Mac OS X Advantages

http://developer.apple.com/wwdc2005/

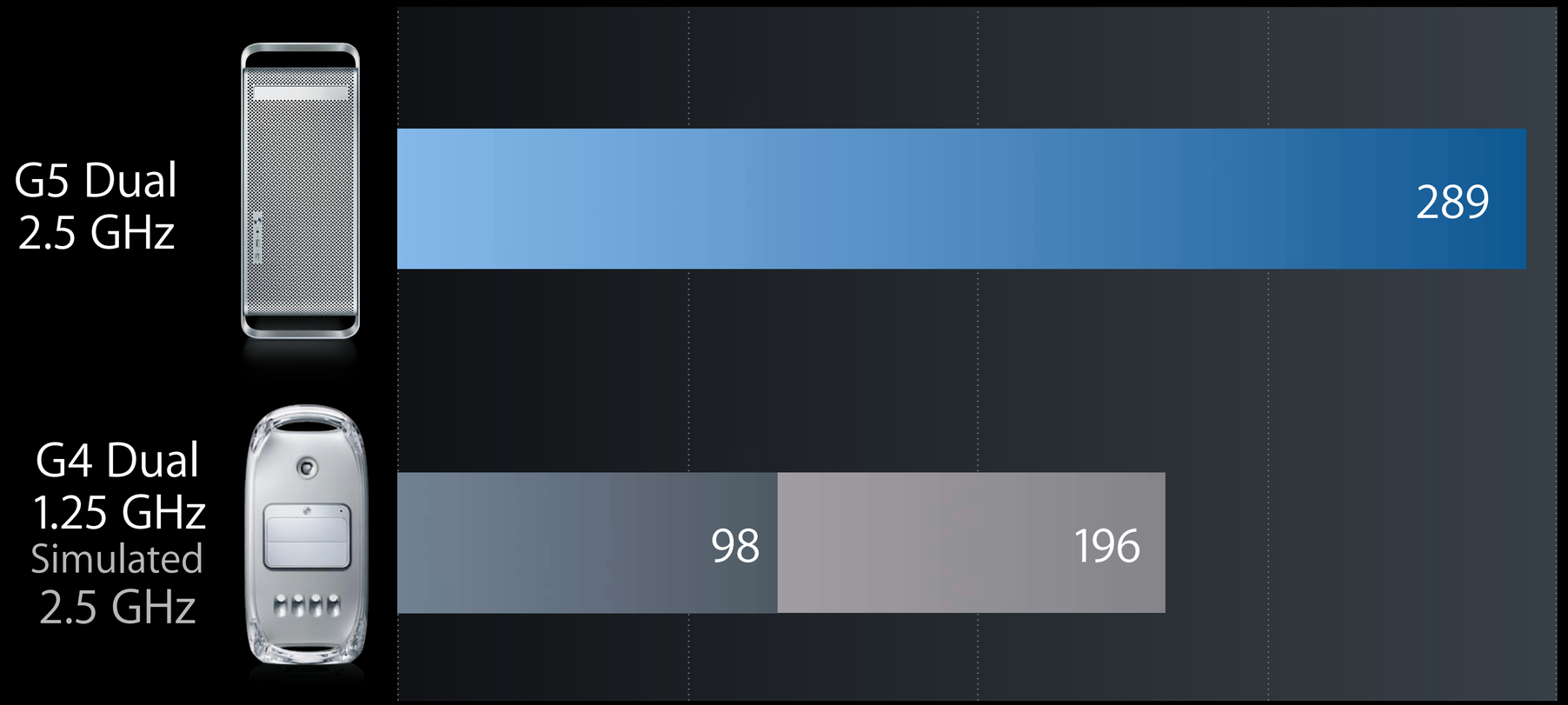
Bundled With the OS

- All versions of Mac OS X have Java in it!
- No extra downloads
- Up-to-date and consistently updated Java versions
- SDK tools integrated into Mac OS X
- Excellent Documentation

G5
G5

Java Optimized for G5 Automatically

SciMark Composite Index



Faster Math With 64-bit Registers, Instructions

Use 64-bit registers and instructions for long math on G5

Java Source

```
static long longAdd(long a, long b)
{
   return a+b;
}
```

G4 Instructions

```
0000: lwz r9,0x40(sp)
0004: lwz r10,0x44(sp)
0008: lwz r7,0x38(sp)
000c: lwz r8,0x3C(sp)
0010: addc r15,r10,r8
0014: adde r14,r9,r7
0018: blr
```

G5 Instructions

```
0000: ld r10,0x40(sp)
0004: ld r9,0x38(sp)
0008: add r14,r10,r9
000c: blr
```

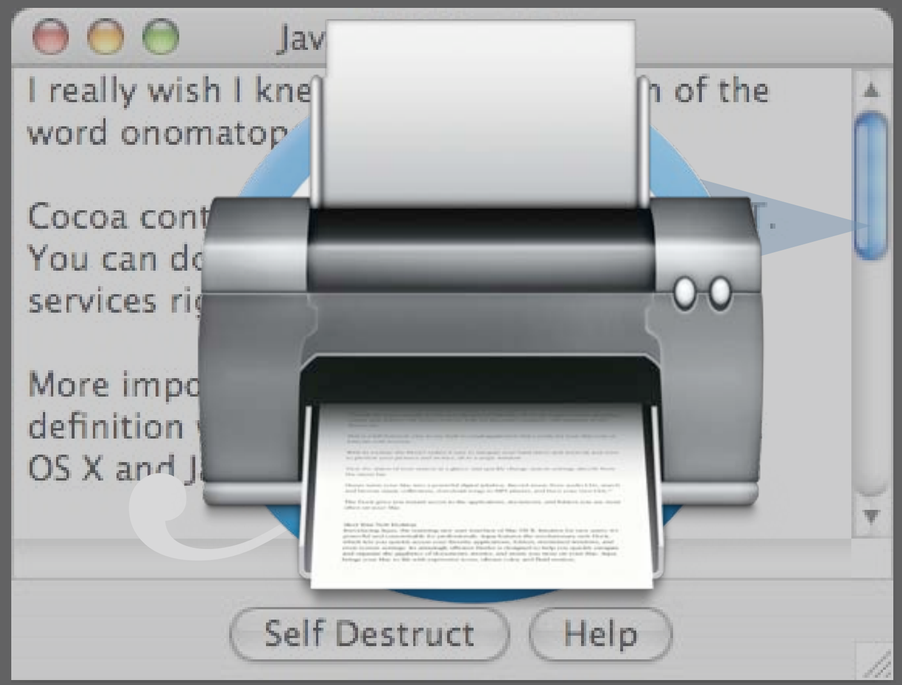
Built on Mac OS X Frameworks

Java API

Mac OS X Framework

Java Printing

Print Services



Demo
javax.print

Mike Swingler
Java Classes Engineer

http://developer.apple.com/wwdc2005/

Built on Mac OS X Frameworks

Java API

Mac OS X Framework

Utilities

Core Frameworks

Security

Keychain Integration

- Security framework now used for trust management
- One place to store certificates in Java
- Works with both applets and Java WebStart

Apple Security Provider

- JCA-based provider
- Built on Mac OS X's CDSA implementation
- Basic feature set
  - MAC, Message Digest cryptography services
  - Keystore implementation with Keychain storage
- There is still more that can be exposed to Java
  - We need your feedback in this area

JGSS Improvements

- Built on Mac OS X Kerberos implementation
- Can now find Kerberos config on Mac OS X
- Access to in-memory credentials
- First J2SE to fully support MIT Kerberos

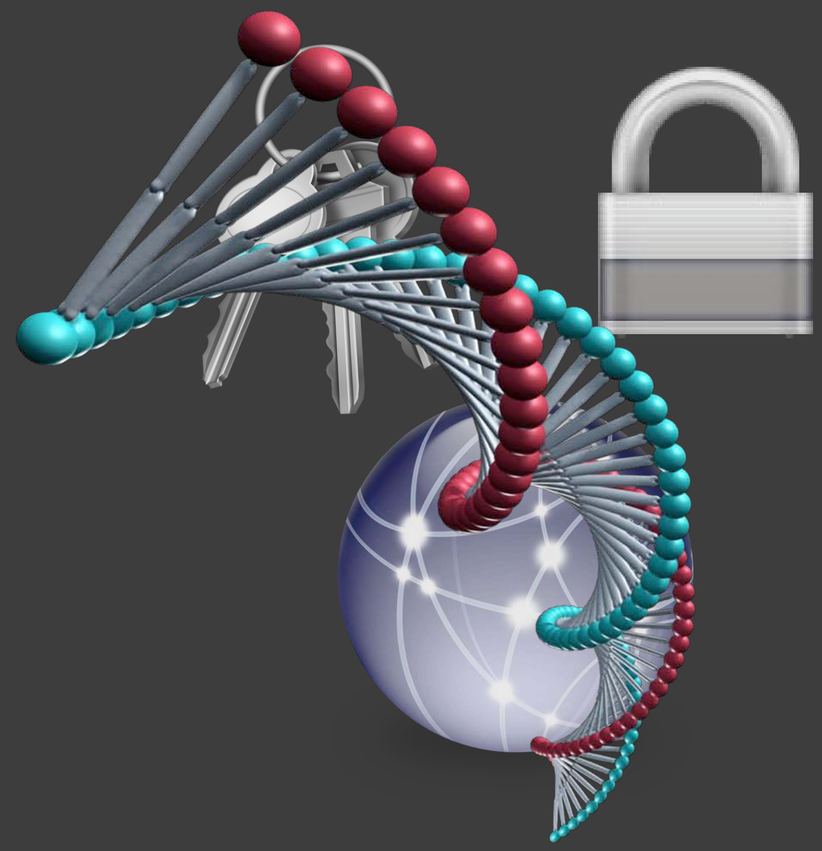
Built on Mac OS X Frameworks

Java API

Mac OS X Framework

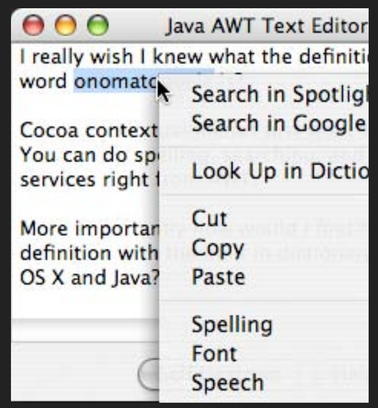
3D Extensions

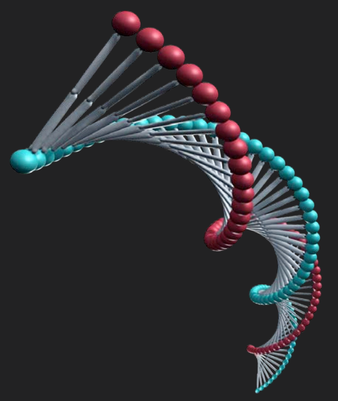
OpenGL



Built on Mac OS X Frameworks

AWT	AWT	Java Accessibility	Java Printing	Utilities	3D Extensions
Cocoa	Quartz	Mac OS X Accessibility	Print Services	Core Frameworks	Core Frameworks



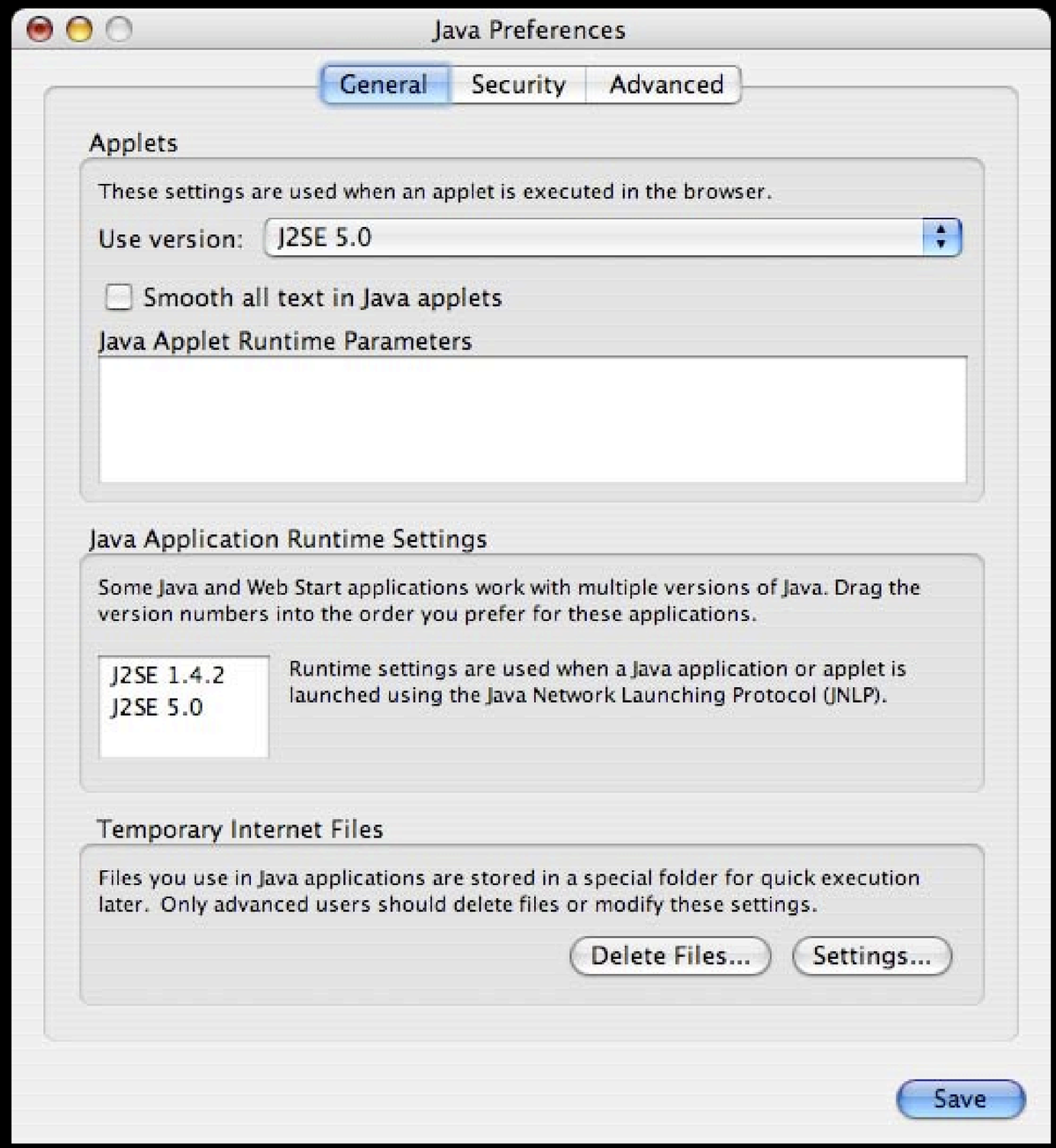


AQUA

Aqua Everywhere

- AWT Widgets
- Swing Aqua LAF
  - Screen Menu Bar
  - Anti-aliasing text by default

- It just works



Extended AWT

- AWT is missing some Mac OS X specifics
- Dock—open document
- Application menu
  - Preferences
  - About
  - Quit
- com.apple.eawt

First Class Java Applications

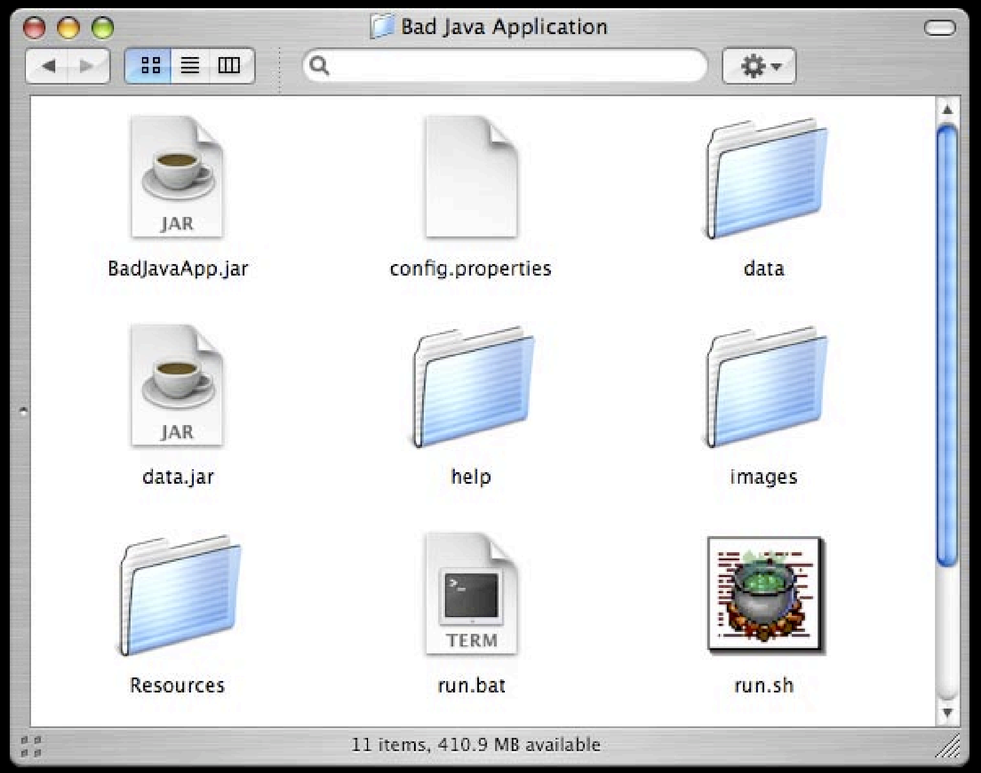
- Bundled applications
- eAWT
- Screen menu bar
- Maintain cross platform code base
- Your feedback

Related session

Develop, Debug and Deploy Java Solutions on Mac OS X

Session 624
Thursday 9:00PM

Bundling Applications

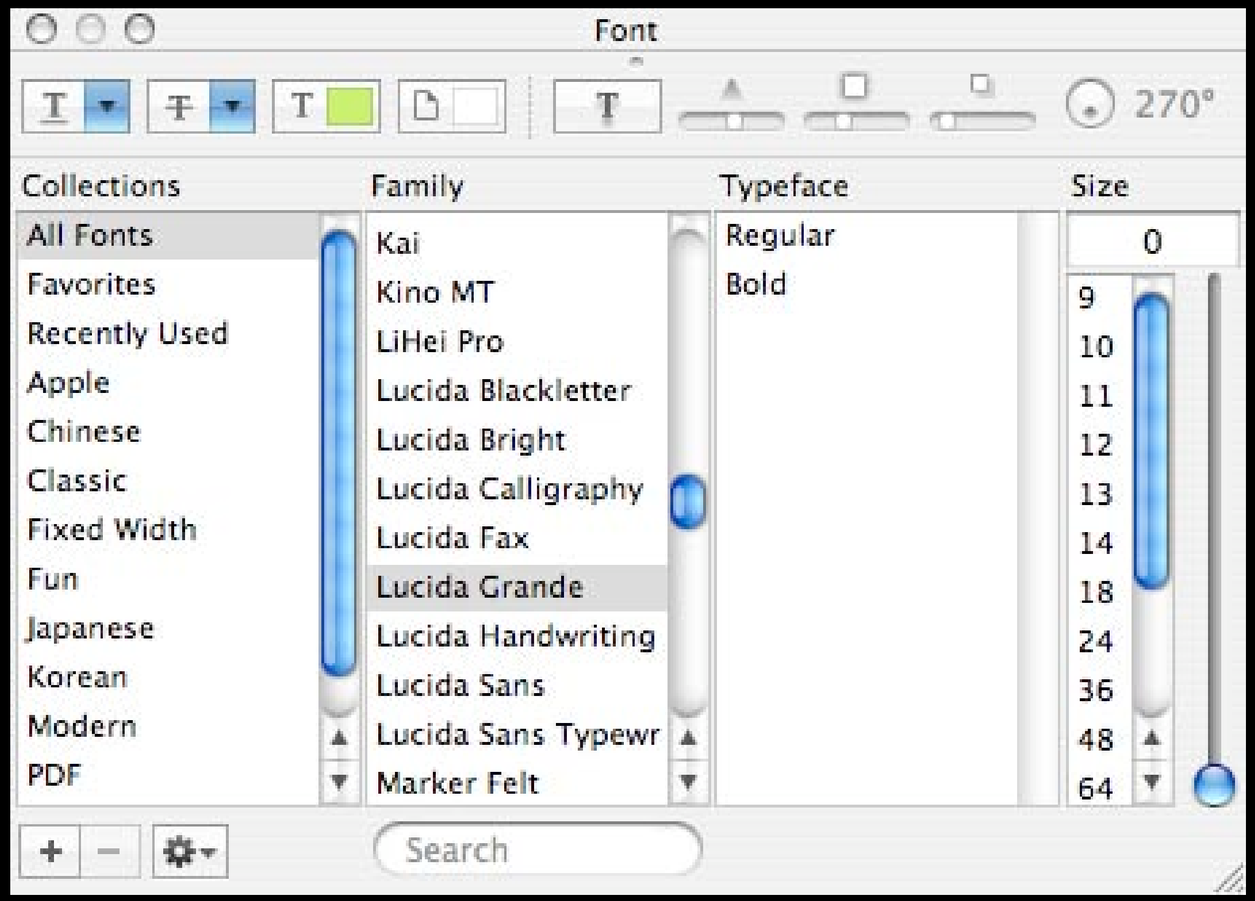


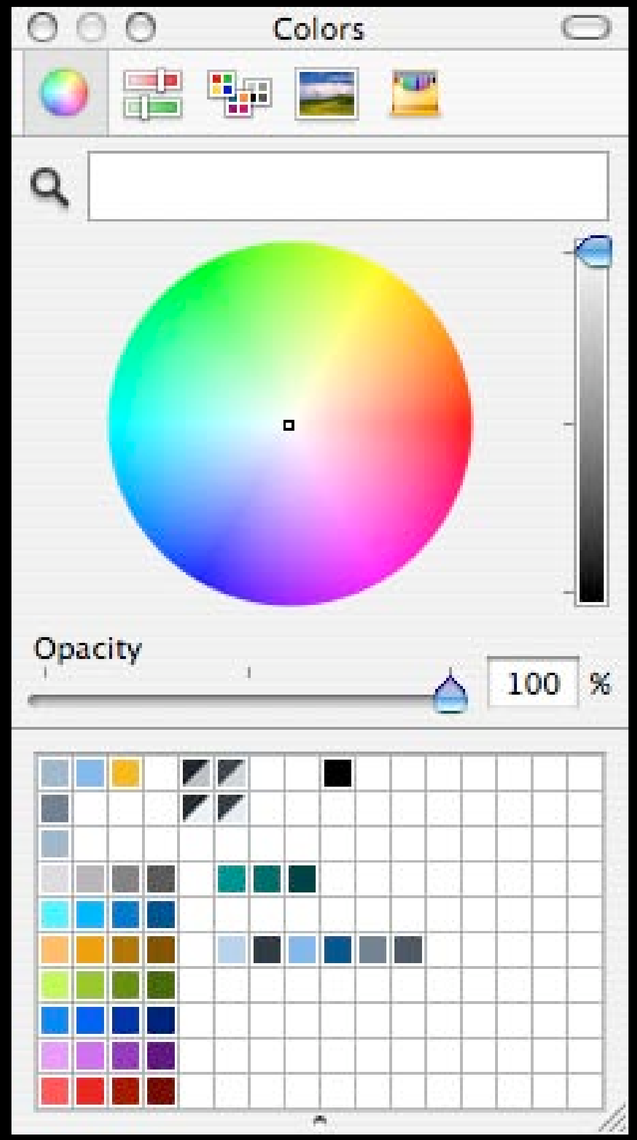
Unbundled Messy Folder

Correct Application Bundle

Cocoa Component

Embed Cocoa views in your Java application





Demo: Cocoa Component

http://developer.apple.com/wwdc2005/

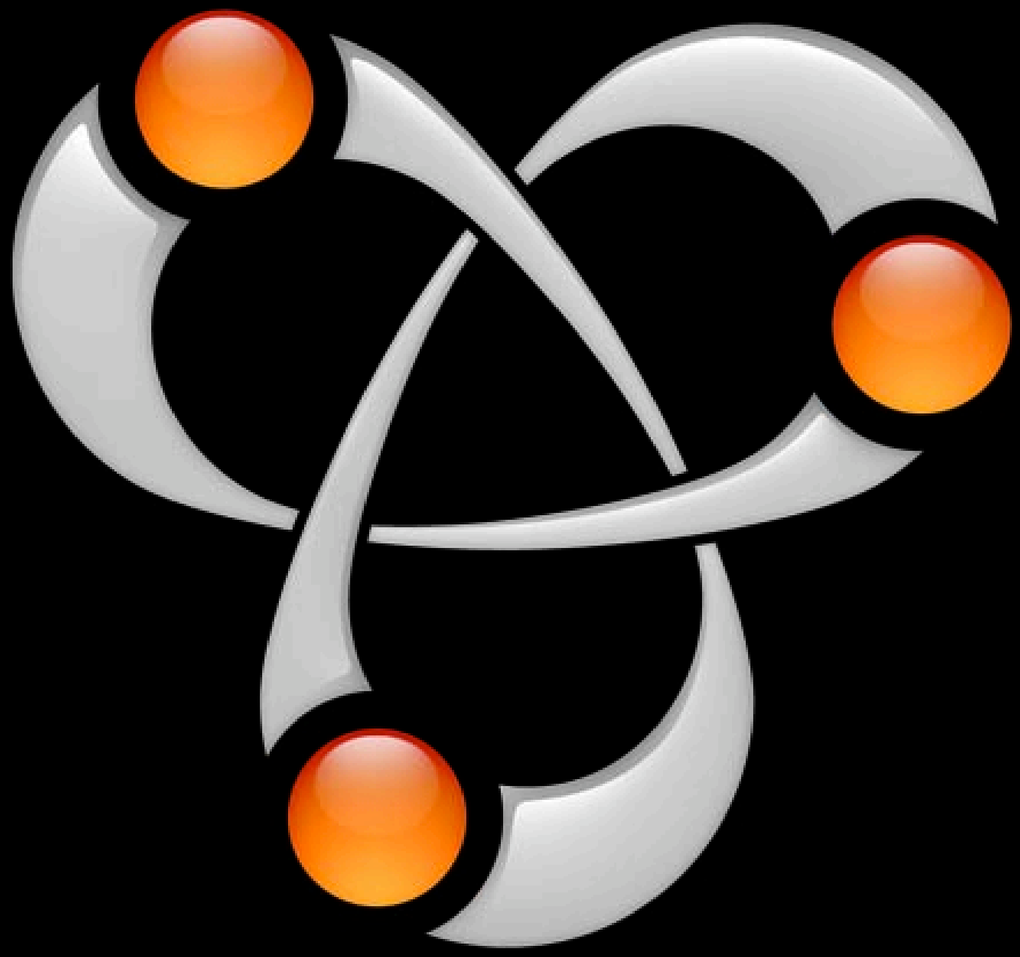
Java and Native Hands On

- Learn how to mix Java and native code
- Understand CocoaComponent
- Go to Hands On: JNI Development on Mac OS X

Related session

JNI Development on Mac OS X

Session 631
Thursday 3:30PM



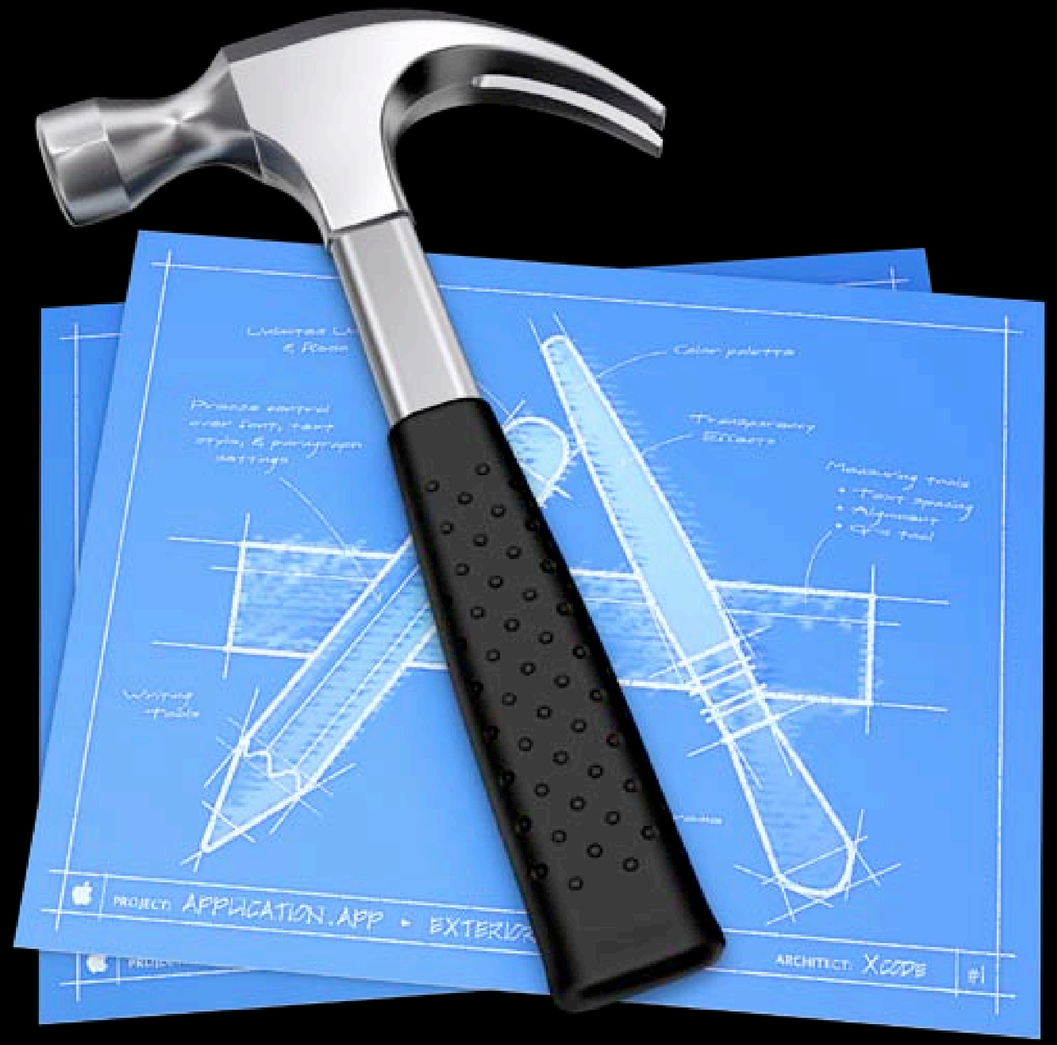
Bonjour for Java

Bonjour for Java

- Bundled with Tiger
- Available for Windows
- Easy to use APIs

- com.apple.dnssd

- Many uses
  - Games
  - Chat
  - Collaborative computing



Mac OS X Java Tools

Mac OS X Java Tools

Xcode 2

- Java and C/Obj-C/C++ side by side
- Integrated debugging
- Code Sense
- Templates—new users start here!
- External Targets
  - gnumake, ant, etc
- Custom executables
- Smart groups

Other Mac OS X Tools

Enterprise Tools

- Mac OS X Server Tiger
- Apache Tomcat
- WebObjects
- JBoss

Integrated J2ME Development

- Use 3rd party emulator for MIDP 2.0
- Apple tools for
  - Building
  - Debugging
  - Profiling
  - Deployment

Third Party Tools

- Eclipse
- JDeveloper
- NetBeans
- IntelliJ IDEA

ORACLE®

Related session **The Next Phase of Eclipse Development**	**Session 642** **Friday 5:00PM**
Related session **Using Oracle JDeveloper With Oracle 10g on Mac OS X**	**Session 605** **Tuesday 10:30AM**

Transitions

http://developer.apple.com/wwdc2005/

What Do Intel-based Macs Mean for Java?

- What works?
- What doesn’t work?
- What’s new?

What Works?

Everything Just Works*

All Java 1.4.2 and J2SE 5.0 applications
work on both PPC and Intel

What Doesn’t Work? (the *)

- 1.3.1 is not supported
- Your JNI libraries need to be recompiled Universal
- Rosetta applications cannot have embedded JVMs

Related session

Java Virtual Machine Exposed

Session 647
Friday 10:30AM

Types of Applications

	Bundled applications	
	Applets in WebKit	
	WebStart applications	
	Jar files	
	Command Line Tools	

But Mostly…

Everything Just Works

Demo

Java on Intel-based Mac

http://developer.apple.com/wwdc2005/

HotSpot Compilers on Mac OS X Tiger

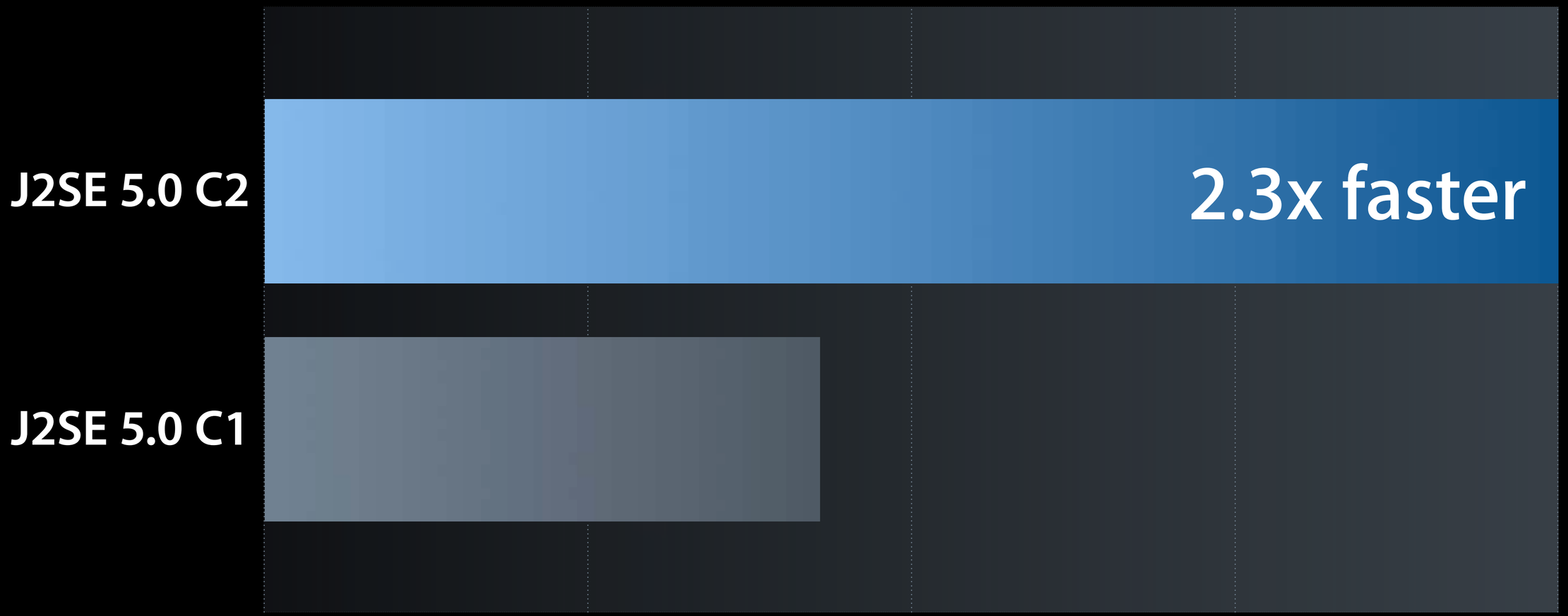
PPC	Intel
J2SE 5.0 C1	J2SE 5.0 C1
Java 1.4 C1	Java 1.4 C1
Java 1.3 C1	J2SE 5.0 C2

The HotSpot C2 Compiler for Intel

- Plugs-in to the JVM just like the HotSpot C1 compiler
- Is run by adding `-server` to the command line
- C2 uses more advanced compilation techniques than C1
- Good for long running and compute intensive applications

Scimark 2.0

Scientific Math Benchmark—Composite Score



We’ve Only Just Begun

- Fast Performance with Tiger on Intel
- C2 compiler when you need it
- Learn more…

Related session

Java Virtual Machine Exposed

Session 647
Friday 10:30AM

Eclipse

Scott Kovatch
Java Classes Engineer

http://developer.apple.com/wwdc2005/

Eclipse 3.1

- Open source development environment
- Go to www.eclipse.org
- Built in Java with Carbon library (SWT)
- Zero code changes to build universal
  - SWT built without modification
  - Minor makefile changes

Related session

The Next Phase of Eclipse Development

Session 642
Friday 5:00PM

Java on Intel-based Macs

- Everything just works*
- Re-bundle with universal launcher
- Build universal JNI libraries

Java Is Growing!

http://developer.apple.com/wwdc2005/

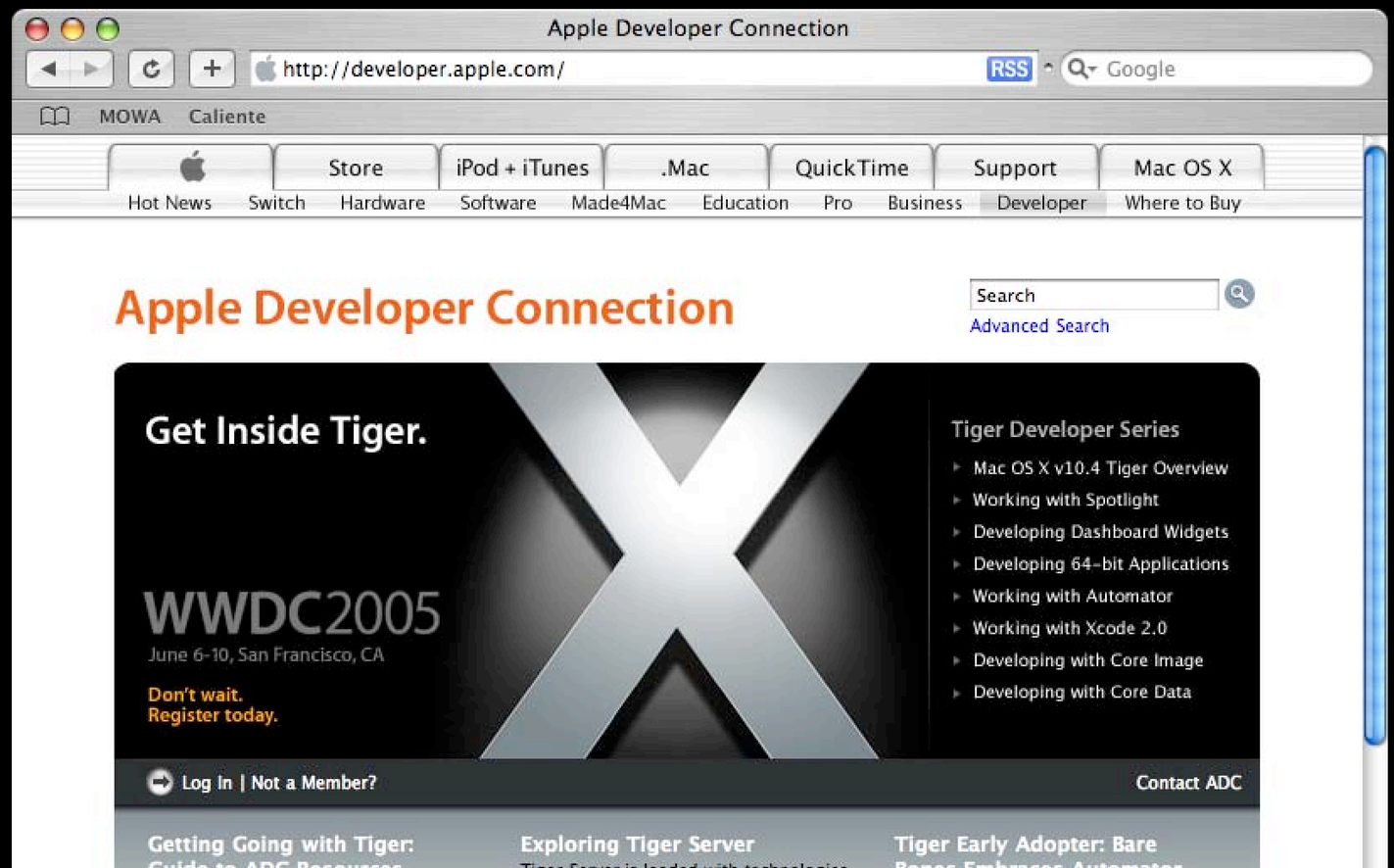
Java on Mac OS X Is Growing

Mac OS X Tiger now supports six different compilers

PPC	Intel
Java 1.4 C1	Java 1.4 C1
J2SE 5.0 C1	J2SE 5.0 C1
Java 1.3 C1	J2SE 5.0 C2

Java on Mac OS X Is Growing

- Expanding Java community
  - Go get on java-dev
    - lists.apple.com
- Check ADC for future previews



More Information

http://developer.apple.com/wwdc2005/

Documentation, Sample Code, and Other Resources

http://developer.apple.com/wwdc2005/

http://developer.apple.com/wwdc2005/

Finder File Edit View Go Window Help
Mon 10:40 AM
PowerBook G4

Hands On

Download and Install Packages

- Get J2SE 5.0 from apple.com
- Try Shark for Java
- Download sample code
- Check out the docs for Apple specific tailoring
  - Check the secure site for links to docs

Hands on with Java on Mac OS X

4 Java specific Hands On Sessions

Related session **Develop, Debug and Deploy Java Solutions on Mac OS X Tiger**	**Session 624 Thursday, 9:00am**	
Related session **Mobile Development with Xcode for J2ME Devices**	**Session 627 Thursday, 10:30am**	
Related session **JNI Developement on Mac OS X**	**Session 631 Thursday, 3:30pm**	
Related session **Performance and Graphics Tuning Your Java Application**	**Session 632 Friday, 9:00am**	

Java Related Hands On sessions

Related session **Swimming with Shark**	**Session 407** **Friday, 2:00PM**	 Hands On
Related session **Hands-On: Using Oracle JDeveloper with Oracle 10g on Mac OS X**	**Session 605** **Tuesday, 10:30am**	 Hands On
Related session **Hands-On: WebObjects Tools**	**Session 607** **Tuesday, 3:30pm**	 Hands On

Labs

Related session

Develop, Debug, and Deploy Java Solutions on Mac OS X Tiger

Session 624
Tuesday, 10:30am

Related session

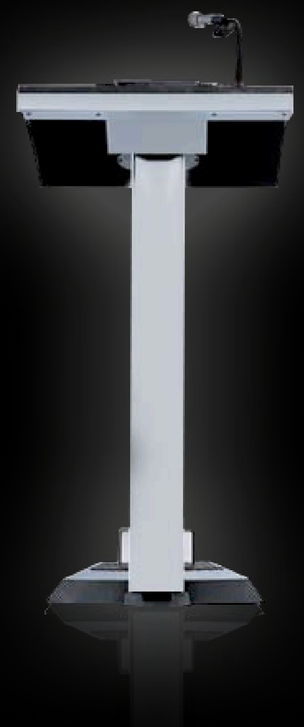
Maximizing Java Performance

Session 6016
Friday, 10:30am

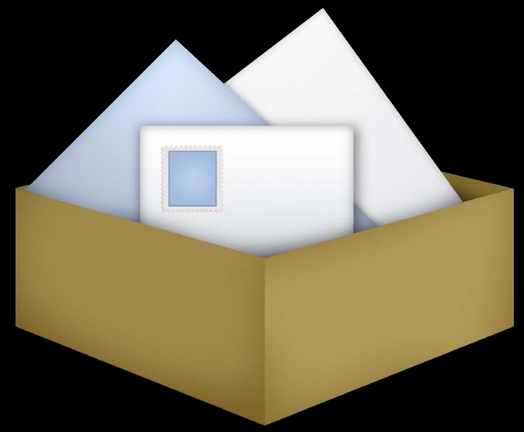
We Want Your Feedback

Hands On

Labs



Feedback Forum



Emails

Who to Contact

Alan Samuel
Java Evangelist
bluker1@apple.com

François Jouaux
Java Technologies Manager
fjouaux@apple.com

Thank you!

http://developer.apple.com/wwdc2005/

WWDC2005

Worldwide Developers Conference